the grating is configured in transmission or reflection mode, respectively. The grating may be used as an output coupler, and may be partially reflective with or without a coating. The grism may have a dielectric AR coating on any transmissive surface and a dielectric HR coating on any reflective surface.

In the Claims

Please cancel Claims 2, 4, and 18, without prejudice, and amend the claims as follows:

1. An excimer or molecular fluorine laser system, comprising:

a laser chamber filled with a gas mixture at least including a halogen-containing species and a buffer gas;

a plurality of electrodes within the laser chamber connected to a discharge circuit energizing the gas mixture;

a laser resonator defining a beam path and including the laser chamber and a line-narrowing and/or line-selection package generating an output beam with a bandwidth less than 1 pm;

the laser resonator including a grating element having a dielectric highly reflective (HR) coating formed thereon, the grating element including a plurality of grooves, the grating element selecting a narrow band from a broader spectral distribution to continue along said beam path after being incident upon said grating element, the grating element dispersing away from the beam path outer portions of said spectral distribution.

3. An excimer or molecular fluorine laser system, comprising:

a laser chamber filled with a gas mixture at least including a halogen-containing species and a buffer gas;

a plurality of electrodes within the laser chamber connected to a discharge circuit energizing the gas mixture;

a laser resonator including the laser chamber and a line-narrowing and/or line-selection package generating an output beam with a bandwidth less than 1 pm;

the laser resonator including a grating element having a dielectric anti-reflective (AR) coating formed thereon, the grating element including a plurality of grooves, the grating element selecting a narrow band from a broader spectral distribution to continue along said beam path after being incident upon said grating element, the grating element dispersing away from the beam path outer portions of said spectral distribution.

5. The laser system of Claim 3, wherein the grating element is disposed in front of a resonator reflector element.

8. An excimer or molecular fluorine laser system, comprising:

a laser chamber filled with a gas mixture at least including a halogen-containing species and a buffer gas;

a plurality of electrodes within the laser chamber connected to a discharge circuit energizing the gas mixture;

a laser resonator including the laser chamber and a line-narrowing and/or line-selection package generating an output beam with a bandwidth less than 1 pm;

the laser resonator including a grism element for dispersing the beam, said grism element having a grating surface and a prism portion, the grating surface including a plurality of grooves, the grism element selecting a narrow band from a broader spectral distribution to continue along said beam path after being incident upon said grism element, the grism element dispersing away from the beam path outer portions of said spectral distribution.

19. The laser system of Claim 8, wherein the grism element has a highly reflecting surface for reflecting the beam as a highly reflective resonator reflector.

23. The laser system of Claim 8, wherein the grism element is disposed in the laser resonator in front of a highly reflective resonator reflector.

28. The laser system of any of Claims 8, 19, 21 or 23, wherein the grism element is oriented such that the prism portion serves as a beam expander.

29. The laser system of Claim 8, wherein the grism element is disposed in the laser resonator in front of a partially reflective resonator output coupler.

30. The laser system of Claim 29, wherein the grating surface has a dielectric AR coating formed thereon.

31. The laser system of any of Claims 29-30, wherein a beam entry/exit surface of the prism portion has a dielectric AR coating formed thereon.

32. The laser system of Claim 8, wherein the grism is disposed within the laser resonator to serve as an output coupling element.

33. The laser system of Claim 32, wherein the grating surface faces the laser discharge chamber and has a dielectric AR coating formed thereon.

34. The laser system of Claim 32, wherein an entry exit surface of the grism faces the discharge chamber and has a dielectric AR coating formed thereon.

35. The laser system of Claim 32, wherein the grating surface faces the laser discharge chamber and is partially reflective such that the grating surface serves as a resonator reflector surface.

36. The laser system of Claim 32, wherein a rear surface of the prism portion faces the discharge chamber and is partially reflecting such that the rear surface of the prism portion serves as a resonator reflector surface.

37. The laser system of any of Claims 8 or 19-24, further comprising a beam expander between the discharge chamber and the grism element.

39. The laser system of Claim 38, wherein said plurality of prisms each has at least one dielectric AR coating formed thereon.

40. The laser system of Claim 37, further comprising an aperture disposed between the discharge chamber and the beam expander.

41. The laser system of Claim 37, further comprising an etalon within the resonator for further line-narrowing and/or line-selection.

42. The grating element of any of Claims 1 or 3, further comprising a bulk substrate having a plurality of grooves formed directly therein, wherein the dielectric coating is formed directly over said substrate and plurality of grooves.

44. The laser system of any of Claims 1 or 3, wherein the grating element further comprises a bulk substrate having said plurality of grooves formed directly therein.

45. The laser system of any of Claims 1 or 3, wherein the grating element further comprises a bulk substrate having a ruled epoxy layer formed thereon having said plurality of grooves.

46. An excimer or molecular fluorine laser system, comprising:

a laser chamber filled with a gas mixture at least including a halogen-containing species and a buffer gas;

a plurality of electrodes within the laser chamber connected to a discharge circuit energizing the gas mixture;

a laser resonator including a line-narrowing and/or line-selection package generating a laser beam,

the laser resonator including a grism element formed from a DUV and/or VUV transparent material, said grism having a prism portion and a grating surface, the grating surface including a plurality of grooves, wherein the surface closest to the discharge chamber has an AR coating formed thereon, the grism element selecting a narrow band from a broader spectral distribution to continue along said beam path after being incident upon said grism element, the grism element dispersing away from the beam path outer portions of said spectral distribution.

47. The laser system of Claim 46, wherein said surface closest to said discharge chamber is said grating surface.

48. The laser system of Claim 47, wherein a rear surface of said prism portion has a HR coating formed thereon.

49. The laser system of Claim 47, wherein a beam entry/exit surface of said prism portion has an AR coating formed thereon, wherein said laser system further comprises a highly reflective resonator reflector after said grism.

50. The laser system of Claim 47, wherein a rear surface of said prism portion is partially reflecting such that said rear surface serves as a beam output coupler of the laser system.

51. The laser system of Claim 46, wherein said surface closest to said discharge chamber is a beam entry/exit surface of said prism portion.

52. The laser system of Claim 51, wherein said grating surface has a HR coating formed thereon.

53. The laser system of Claim 51, wherein said grating surface has an AR coating formed thereon, wherein said laser system further comprises a highly reflective resonator reflector after said grism.

54. The laser system of Claim 51, wherein said grating surface is partially reflecting such that said grating surface serves as a beam output coupler of the laser system.

55. An excimer or molecular fluorine laser system, comprising:

a laser chamber filled with a gas mixture at least including a halogen-containing species and a buffer gas;

a plurality of electrodes within the laser chamber connected to a discharge circuit energizing the gas mixture;

a laser resonator including a line-narrowing and/or line-selection package generating a laser beam,

the laser resonator including a grism element formed from a DUV and/or VUV transparent material, said grism having a prism portion and a grating surface, the grating surface including a plurality of grooves, wherein the surface closest to the laser chamber is partially reflecting and serves as a beam output coupler of said laser system, the grism element selecting a narrow band from a broader spectral distribution to continue along said beam path outside the laser resonator after being incident upon said grism element,

the grism element dispersing away from the beam path outside the laser resonator outer portions of said spectral distribution.

56. The laser system of Claim 55, wherein said partially reflecting surface is said grating surface.

57. The laser system of Claim 55, wherein said partially reflecting surface is a rear surface of said prism portion and said outcoupled beam exits said grism through said grating surface.

Please add the following new claims:

58. The laser system of any of 8, 46 or 55, further comprising a bulk substrate having said plurality of grooves formed directly therein, wherein the dielectric coating is formed directly over said substrate and plurality of grooves.

59. The laser system of any of Claims 8, 46 or 55, further comprising a bulk substrate having a ruled epoxy layer formed thereon having said plurality of grooves, wherein the dielectric coating is formed directly over said ruled epoxy layer.

60. The laser system of any of Claims 8, 46 or 55, further comprising a bulk substrate having said plurality of grooves formed directly therein.

61. The laser system of any of Claims 8, 46 or 55, further comprising a bulk substrate having a ruled epoxy layer formed thereon having said plurality of grooves.

REMARKS

Claims 1, 3, 5-17 and 19-61 are pending in this application. Claims 58-61 are newly added and find support at Figs. 2-7, and at page 17, lines 25-28, and other places throughout Applicants' specification. The claims have been re-numbered from the second iteration of Claim 26, as originally filed, as that number plus 1. Applicants appreciate the Examiner's attentiveness to this error in the original claim numbering. The dependencies of several of the claims have been correspondingly amended.